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L. C. Hanson
Company
Wheeler-
Lagerquist Mine
Project, MT A/E
86-46-104,
Sheridan County,

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FINAL REPORT

WHEELER-LAGERQUIST MINE PROJECT
MT A/E 86-46-104
SHERIDAN COUNTY, MONTANA

NOVEMBER, 1986

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FINAL REPORT

WHEELER-LAGERQUIST MINE PROJECT
MT A/E 86-46-104
SHERIDAN COUNTY, MONTANA

NOVEMBER, 1986

Prepared for: MR. RICHARD JUNTUNEN, CHIEF
Abandoned Mine Reclamation Bureau
Department of State Lands
1625 11th Avenue
Helena, MT 59620

Prepared by: L. C. HANSON COMPANY
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Project Engineers

KEVIN REDMOND, DAVE MCCLOY
Project Inspectors

L. C. HANSON COMPANY
CONSULTING ENGINEERS & SURVEYORS
HELENA — GREAT FALLS — GLENDIVE

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FINAL REPORT

WHEELER-LAGERQUIST MINE PROJECT

I. INTRODUCTION

A. Project Objectives

The WHEELER-LAGERQUIST MINE PROJECT reclamation work was undertaken to cleanup debris, backfill and regrade subsidence features, and revegetate all disturbed areas.

B. History

The site consists of three separate subsurface mines within 1/2 mile of each other. The mines began operating in the 1920's and continued up into the 1950's. The past mining is indicated by subsidence, mine openings, and the large volume of debris and abandoned mining equipment. There were no mining records or maps available and the extent of the mine workings is unknown.

C. Project Location

The project site consists of five (5) separate areas in the $S\frac{1}{2}$ of Section 10, T35N, R58E approximately $5\frac{1}{2}$ miles southwest of Westby, Montana.

D. Site Descriptions and Problems

The project site contained five areas which are heavily subsided. Debris was scattered throughout the project area.

The subsidence features posed a hazard to both man and cattle. The project area was circumvented by agricultural activities on the

adjacent land.

The area is actively subsiding as evidenced by seven (7) new holes that appeared during the course of the project. These holes were also backfilled during the course of the project.

The construction limits were confined to the five separate areas noted on the Plans and amounted to 6.42 acres. The access roads between the work areas were also included in the project limits and amounted to 0.50 acres.

II. DESCRIPTION OF RECLAMATION PROJECT

A. Project Planning

The major items of work addressed the elimination of safety hazards, namely the backfilling and/or regrading of subsidence features. Elimination of the subsidence features will allow the land to be placed back into agricultural use.

B. Chronological History

1. Project advertised for three consecutive weeks.
2. Pre-bid conference held on-site on May 27, 1986.
3. Bids opened on June 10, 1986.
4. Contract awarded on June 13, 1986 to:

   L.P. ANDERSON CONTRACTOR, INC.
   P.O.Box 1106
   Glendive, MT 59330

5. Pre-construction meeting held on July 8, 1986.
6. Contract time started on July 8, 1986.
7. All work with the exception of revegetation work was completed on August 3, 1986.

8. Temporary Shutdown Order issued on August 5, 1986
9. Resume Work Order issued on October 18, 1986.
10. Revegetation work completed on October 19, 1986.
11. Final inspection by Owner completed on October 8, 1986.

C. Equipment

1. 2- TS14B Scrapers
2. Cat D6D Dozer
3. 2400 Gal Water Tank loaded on Dump Truck
4. Bantam Hoe C415
5. Cat 966 Loader - 3 C.Y.
6. Mulch Spreader and Tucker
7. Rock Picker
8. J.D. Tractor w/Van Brunt Double Disc Press Drill (11 Ft)

D. Construction Operations

1. Stripped and salvaged topsoil.
2. Cleaned up debris for burning and/or burial.
3. Provided water to designated subsidence features.
4. Performed bank caving operations.
5. Subsidence features were backfilled and/or graded. Diversion ditch and positive drainage constructed through work area.
6. Topsoil replaced and disced. Rock picker used where necessary.
7. Mulch spread and tucked into soil. All roads disced.
8. Work suspended until Fall seeding period.
9. Seed and fertilizer applied with drill in Fall.

III. COST SUMMARY

A. Final Payment Request and Reconciliation Change Order

A copy of the Final Payment Request and Reconciliation Change Order are

contained in Appendix A. These documents summarize the final quantities and costs for each work item.

B. Change Orders

Change Order No. 1 - Reconciliation of Final Quantities.

C. Cost per Site/Unit

1. Total Cost - $44,954.28
2. Cost per Acre - 6.42 ac = $7,002.22/ac
3. Cost per Acre per Work Item (6.42 ac)
   a. Debris Cleanup - $179.13/ac
   b. Bank Caving - $192.37/ac
   c. Salvage and Replace Topsoil - $2,045.37/ac
   d. Subsidence Backfill - $466.20/ac
   e. Subsidence Grading - $1,724.30/ac
   f. Provide Water - $448.04/ac
   g. Seed - $369.94/ac *
   h. Fertilizer - $106.15/ac *
   i. Vegetative Mulch - $1,200.00/ac

* Includes access roads - total acres - 6.92

IV. SUMMARY

A. Completed Reclamation

The Contractor was allowed forty-five (45) days to complete the project. The project was actually completed in twenty-nine (29) days.

The project resulted in removing of debris and the elimination of subsidence features. Elimination of the health and safety hazards will allow the area to be placed into agricultural production.

B. Comments

The Contractor completed the work as specified. His equipment was generally well-maintained and efficiently used.

Monitoring of this site for additional subsidence will be required. Seven holes appeared during the course of the project which may indicate that active subsidence is still on-going.

V. SLIDES

The slide logs and slides are contained in Appendix B.

APPENDIX A

Payment Request No. 2
(Final)

RECEIVED
NOV 13 1986
LOWELL C. HANSON CO.

From: October 18, 1986 To: October 19, 1986

Project Name: Wheeler-Lagerquist Mine Project

Location: Sheridan Co. Mt. Project No.: Mont A/E 86-46-104

Name Of Contractor: L.P. Anderson Contr. Address: PO Box 1106 Glendive, Mt 59330

Summary Of Project Status	
Amount of Original Contract	$40,774.55
Amount of Approved Change Order(s)	4,179.73
TOTAL CONTRACT AMOUNT	44,954.28
Contract Time Used to Date	29 Days
Percentage of Contract Time Used	64%
Percentage of Contract Amount Earned	100%

Original Contract Amount Completed	40,774.55
Change Order(s) Amount Completed	4,179.73
Amount for Materials On Site	0.00
TOTAL To Date	44,954.28
Times 90% =	No Retainage
TOTAL AMOUNT Earned To Date	44,954.28
Less Previous Amount Earned	37493.73
Amount Payable This Period	7,460.55
Less 1% Gross Receipts Tax	74.61
TOTAL DUE CONTRACTOR THIS PERIOD	$7,385.94

Requested By: L.P. Anderson Contr Jerry L. Morris Vice Pres Date: 11-8-86
(Contractor)

Checked By: L.C. Hanson Co. Allan W Hanson Date: 11-13-86
(Engineer)

Approved By: Department of State Lands [signature] Date: 11/14/86
Abandoned Mine Reclamation Bureau (Owner)

PAY REQUEST NO. 2

L.C Hansen Co.

PROJECT: Wheeler-Lagerquist MONT A/E 8e-46-104 Page 2 of 2

ITEMIZATION OF QUANTITIES AND COSTS

ITEM NO.	DESCRIPTION	ESTIMATED PLAN QUANTITY	UNIT BID PRICE	UNITS OF WORK COMPLETED THIS REQUEST	UNITS OF WORK COMPLETED TO DATE	TOTAL COST OF COMPLETED WORK	% OF EST. QUANT. COMP.
1	Mobilization	1.0 L.S.	1500.00	0.00	1.00	1500.00	100*
2	Debris Cleanup	1.0 L.S.	1150.00	0.00	1.00	1150.00	100*
3	Bank Caving	10.0 Hr.	95.00	0.00	13.00	1235.00	100*
4	Salvage & Replace Topsoil	9000.0 C.Y.	1.30	0.00	10101.00	13131.30	100*
5	Subsidence Backfill	2060.0 C.Y.	1.00	0.00	2993.00	2993.00	100*
6	Subsidence Grading	1.0 L.S.	11070.00	0.00	1.00	11070.00	100*
7	Provide Water	113.3 MGal.	25.50	0.00	112.80	2876.40	100*
8	Seed	121.5 lb.	16.00	160.00	160.00	2560.00	100*
9	Fertilizer	534.0 lb.	1.10	667.80	667.80	734.58	100*
10	Vegetative Mulch	17310.0 lb.	0.40	0.00	19260.00	7704.00	100*
	Sub-Total					44954.28	
	Total					44954.28	

* Work completed on this item

SECTION II

2.12 CHANGE ORDER Order No. 1

Date: October 29, 1986

Agreement Date: June 13, 1986

NAME OF PROJECT: WHEELER-LAGERQUIST MINE PROJECT

MT A/E 36-46-104

OWNER: Montana Department of State Lands

CONTRACTOR: L. P. Anderson Contractor, Inc.

Change Orders must be accompanied by an itemized cost breakdown. You are hereby requested to comply with the following changes from the Contract Documents. (Show separate costs for materials, labor, equipment and miscellaneous. Show percent where applicable.)

ITEM NO.	DESCRIPTION OF CHANGES - ESTIMATED QUANTITIES & UNITS	COST OF CHANGES					TOTAL COST
		MAT'LS	LABOR	EQUIP.	MISC.	TOTAL UNIT COST	
	RECONCILIATION OF FINAL QUANTITIES (See Attached Sheet)						

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RECEIVED
NOV 18 1986
LOWELL C. HANSON CO.

TOTAL COST - MAT'LS, LABOR, EQUIPMENT & MISC.	
OVERHEAD & PROFIT @ _____ %	
GRAND TOTAL - THIS CHANGE ORDER	+ $ 4,179.73

Original Contract Price	$40,774.55
Current Contract Price Adjusted by Previous Change Order	0.00
Cost This Change Order (+ or -)	+ 4,179.73
New Contract Price Including This Change Order	+$ 44,954.28

LOWELL C. HANSON CO.

The completion date as set forth in the Contract Documents shall be (unchanged, ~~xxxxxxxxxxxxxxxxxxxx~~ by 0 calendar days.

The date for completion of all work will be November 6, 1986.

Description and Justification for Change:

1. The actual quantities shown were a result of meeting field conditions encountered during construction. Seven (7) new subsidence holes appeared during the course of the construction work.

SURETY CONSENT

The surety hereby consents to the aforementioned Contract Change Order and agrees that its bond or bonds shall apply and extend to the Contract as thereby modified or amended per this Change Order. The principal and the Surety further agree that on or after execution of this consent, the penalty of the applicable Performance Bond or Bonds is hereby increased by FOUR THOUSAND ONE HUNDRED SEVENTY NINE & 73/100 ($ 4,179.73) (One hundred percent (100%) of the Change Order amount) and the penalty of the applicable Payment Bond or Bonds is hereby increased by FOUR THOUSAND ONE HUNDRED SEVENTY NINE & 73/100 ($ 4,179.73) (One hundred percent (100%) of the Change Order amount).

COUNTERSIGNED BY MONTANA RESIDENT AGENT

W. A. Mitchell Agency

SURETY

UNITED STATES FIDELITY & GUARANTY CO.

BY: (Seal)

Recommended by: L. C. Hanson Company Allan W Hyer, Engineer Date 10/29/86

Accepted by: [illegible], Contractor 11-5-86

Approved by: [illegible], Owner 11/19/86

Change Order No. 1
WHEELER-LAGERQUIST MINE PROJECT
MT A/E 86-46-104

RECONCILIATION OF QUANTITIES

Item No.	Description	Estimated Quantities	Actual Quantities	Change in Price
3.	BANK CAVING	10.0 HOURS	13.0 HOURS	+ $ 285.00
4.	SALV & REPLACE TOPSOIL	9000.0 C.Y.	10,101.0 C.Y.	+ 1,431.30
5.	SUBSIDENCE BACKFILL	2060.0 C.Y.	2993.0 C.Y.	+ 933.00
7.	PROVIDE WATER	113.3 MGAL	112.8 MGAL	- 12.75
8.	SEED	121.5 LBS	160.0 LBS	+ 616.00
9.	FERTILIZER	534.0 LBS	667.8 LBS	+ 147.18
10.	VEGETATIVE MULCH	17,310.0 LBS	19,260.0 LBS	+ 780.00
	TOTAL CHANGE IN PRICE			+ $ 4,179.73

APPENDIX B

SLIDE LOG

WHEELER-LAGERQUIST MINE

1.	7-8-86	Wheeler - Area #1	Topsoil removal (scraper).
2.	7-8-86	Wheeler - Area #1	Topsoil removal (Bantam hoe).
3.	7-10-86	Debris - Area 1	Collection area (debris).
4.	7-10-86	Area 1	Debris pile/stripped holes.
5.	7-10-86	Area 1	Grave site.
6.	7-10-86	Area 1	Scraper removing soil from holes.
7.	7-10-86	Area 1	Overturned hoe.
8.	7-10-86	Area 1	Overturned hoe.
9.	7-10-86	Area 1	Overturned hoe.
10.	7-10-86	Area 1	Overturned hoe.
11.	7-10-86	Area 1	Overturned hoe.
12.	7-10-86	Area 1	Overturned hoe.
13.	7-1--86	Area 1	Overturned hoe.
14.	7-10-86	Area 1	Debris burning.
15.	7-10-86	Area 1	New collapse #1 (20' depth).
16.	7-10-86	Area 1	New collapse #1.
17.	7-10-86	East of Site	Water storage pond.
18.	7-10-86	East of Site	Overall view of hill.
19.	7-10-86	East of Site	Overall far off view of site.
20.	7-11-86	Area 1	Stirring debris burn pile.
21.	7-14-86	Collapse #1	Bank caving.
22.	7-14-86	Collapse #1	Bank caving (close-up).
23.	7-14-86	Area 1	Shaping topsoil pile.
24.	7-15-86	Area 1	Shaped topsoil pile at completion.
25.	7-15-86	Area 5 (looking west)	Various work activities (far off view).
26.	7-15-86	Area 2	Overall view w/topsoil pile.
27.	7-15-86	Area 5	Debris collection site.
28.	7-15-86	Area 5	Under cut subsidence hole.
29.	7-16-86	Area 5	Collapse Hole #2 (surface view).
30.	7-21-86	Collapse #3	Bank caving.

SLIDE LOG

WHEELER-LAGERQUIST MINE

31.	7-21-86	Collapse #3	Bank Caving.
32.	7-21-86	Area Debris Pile	Starting pile burn.
33.	7-21-86	Area Debris Pile	Starting pile burn.
34.	7-21-86	Area Debris Pile	Fully-burning pile.
35.	7-21-86	Area 5	Various Cat photos.
36.	7-21-86	Area 5	While stuck in hole.
37.	7-21-86	Area 5	"Stuck Cat"
38.	7-21-86	Area 5	Ramped out holes almost ready for backfill/grading.
39.	7-21-86	Area 5	Ramped out holes almost ready for backfill/grading.
40.	7-21-86	Area 5	2 Scrapers at work (borrowing/grading).
41.	7-22-86	Area 5	Diversion ditch.
42.	7-22-86	Area 5	Scarifying slopes for topsoil.
43.	7-22-86	Area 2	After backfill.
44.	7-22-86	Area 1	Collapse #5 (tire hole).
45.	7-22-86	Area 1	Collapse #4 (tire hole).
46.	7-28-86	Area 5	Ripping topsoil.
47.	7-28-86	Area 5	Soil preparation.
48.	7-28-86	Area 1	Tire rolling grading area before backfill.
49.	7-28-86	Area 1	Ripping/grading activities.
50.	7-28-86	Area 1	Midway thru grading (looking north).
51.	7-28-86	Area 1	Miscellaneous grading (looking west).
52.	7-28-86	Area 1	Miscellaneous grading (looking south).
53.	7-28-86	Area 1	Miscellaneous grading (looking east).
54.	7-29-86	Area 1 (compare w/ Photo #51)	Looking west at grading area.
55.	7-29-86	Area 1 (compare w/ Photo #52)	Looking south 2 hours later.
56.	7-29-86	Area 1 (compare w/ Photo #53)	Collapse #7 (looking east).
57.	7-29-86	Area 1 (compare w/ Photo #53)	Collapse #7 (looking east).
58.	7-29-86	Area 1	Collapse #6.
59.	7-29-86	Collapse #6 and #7	Backfill activities.
60.	7-29-86	Area 1	Scarifying graded area.

SLIDE LOG

WHEELER-LAGERQUIST MINE

61.	7-29-86	Area 1	Scarifying graded area.
62.	7-31-86	Area 3	Scarified road to Area 3.
63.	7-31-86	Area 1	Rock picker at work.
64.	7-31-86	Area 1	Discing the soil.
65.	8-1-86	Area 1	Chopper w/sign and grading area.
66.	8-2-86	Area 3	Mulched area.
67.	8-2-86	Area 5	Mulched area.
68.	8-2-86	Area 5	Mulching equipment.
69.	8-2-86	Area 5	Various mulching shots.
70.	8-2-86	Area 5	Various mulching shots.
71.	8-2-86	Area 5	Various mulching shots.
72.	8-2-86	Area 5	Various mulching shots.
73.	8-2-86	Area 3	Completed area (except seeding).
74.	8-2-86	Area 2	Finished area.
75.	8-2-86		Spreader.
76.	8-2-86	Area 1	Look at mulch on slope.
77.	8-2-86	Area 5 (looking west from Area 1)	Mulched area.
78.	8-2-86	Area 1	Mulching.
79.	8-2-86	Area 1	Mulching.
80.	8-2-86	Area 1	Mulching.
81.	8-2-86	Area 1 1	Mulching.
82.	8-2-86	Area 1	Mulching.
83.	8-2-86	Area 1 - 2	Scarified road.
84.	8-2-86	Area 1 - 2	Mulching.

APPENDIX C

ANALYSIS OF PROFESSIONAL SERVICE FEES
DATE OF PREPARATION: November 19, 1986
PROJECT: Wheeler - Lagerquist

PROFESSIONAL SERVICE	AMOUNT
* Data Gathering, Site Evaluation, Preliminary Engineering, Final Engineering, Bidding Documents	$14,669.66
* Construction Administration, Construction Inspection, Final Report Preparation	$8,960.31
L.C. HANSON CO. COSTS	$23,629.97
CONSTRUCTION COSTS	$44,954.28

PERCENTAGE ANALYSIS

PRE-CONST. LCH CO COST/CONSTRUCTION COST	32.63%
CONST. & POST CONST. LCH CO. COST/CONSTRUCTION COST	19.93%
TOTAL LCH CO. COST/CONSTRUCTION COST	52.56%

REMARKS: Services provided include lien determination, landowner consent, budget preparation, grant application, weed board approval, basic engineering, construction staking, contract administration, quantity accounting and full time resident inspection. This site was very remote. The level of reclamation contemplated changed during the plan development stage.